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New Subspecies of *Carabus albrechti* Morawitz (Coleoptera, Carabidae) from Japan

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Four new subspecies of *Carabus* (*Ohomopterus*) *albrechti* are described: *C. a. hidakanus* nov. and *C. a. itoi* nov. from Hokkaido, and *C. a. echigo* nov. and *C. a. awashimae* nov. from the Japan Sea side of central Honshu and Awashima Is., respectively.

Key Words: Coleoptera, *Carabus albrechti*, revisional studies, geographical variation, subspecies, new subspecies, Hokkaido, Honshu.

Carabus albrechti Morawitz is a small to medium-sized species of the subgenus *Ohomopterus*, distributed in northern Honshu east of the Itoigawa-Shizuoka Tectonic Line and as far north as Hokkaido. In our revisional studies on the geographical variation of the *C. albrechti* group, two geographical races were distinguished from the subspecies so far recognized as *C. a. albrechti* in Hokkaido, and two others from subspecies which have been vaguely defined as *C. a. freyi* and *C. a. esakianus* in Honshu.

***Carabus* (*Ohomopterus*) *albrechti albrechti* Morawitz**

Carabus Albrechti Morawitz, 1862, pp. 237-238; type locality: Hakodate.

Carabus Albrechti: Morawitz, 1863, pp. 10-11.

Carabus (*Apotomopterus*) *albrechti* (part.): Breuning, 1932, pp. 235-236.

Apotomopterus albrechti (part.): Nakane, 1952, pp. 50-51.

Apotomopterus albrechti (part.): Nakane, 1953, p. 96 (48).

Apotomopterus japonicus albrechti (part.): Nakane, 1962, p. 39.

Apotomopterus albrechti albrechti (part.): Ishikawa, 1969, pp. 520-521, figs 1 & 21.

Carabus (*Ohomopterus*) *albrechti albrechti* (part.): Ishikawa, 1985, p. 21.

Carabus albrechti was originally described by Morawitz (1862) on the basis of specimens from Hakodate. The nominotypical subspecies is characterized by a small pronotum compared with those of other subspecies in Hokkaido, and by the finger-shaped tip of the aedeagus.

Length: ♀, 21.5-25.5mm; ♂, 20.5-23.5mm.

Upper surface of body copper or dark copper. Legs mostly wholly black, or tibiae rarely somewhat rufous in part. Antennae short, barely reaching beyond middle of elytra in male; underside of antennal segments 5-7 concave for about 1/2-2/3 their

length, but concaved areas vaguely outlined, and with sparse hairs except on specimens from type locality. Head with vertex weakly punctate, and with coarse rugae extending from frons to neck. Inner margin of male protibia weakly convex. Pronotum small; sides weakly cordately sinuous; disk convex, with 3-5 (rarely 7 or 8) marginal setae; postero-lateral corners weakly angularly produced (Fig. 3). Elytra short and convex; striae very weakly notched or not.

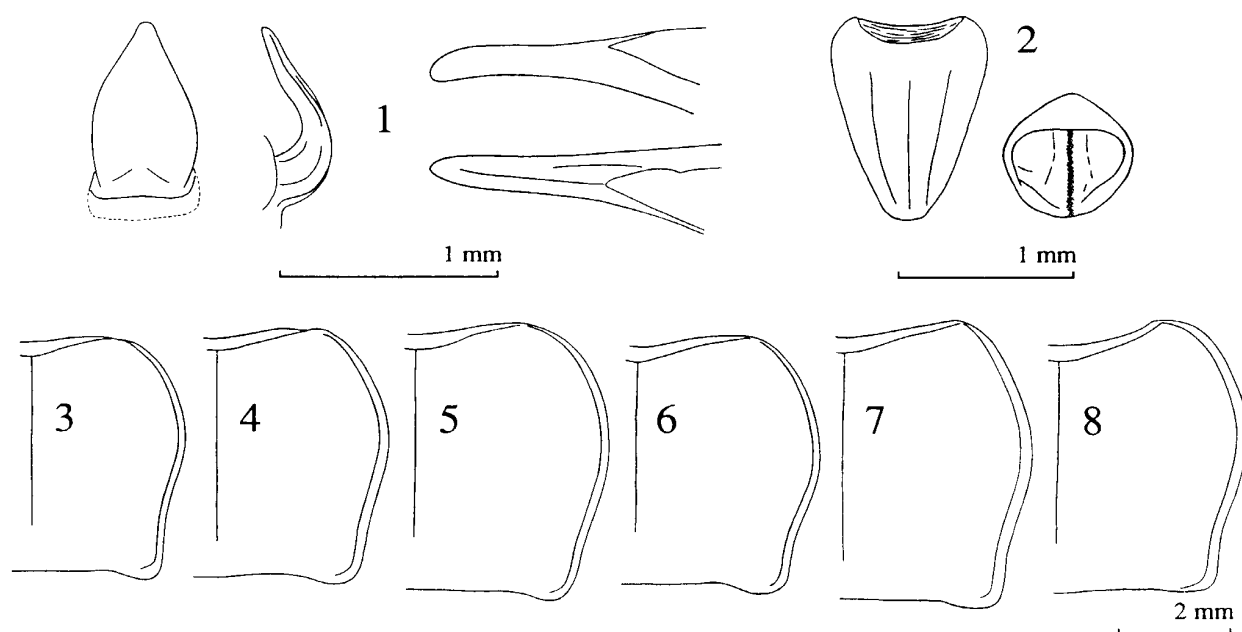
Male genitalia: Apical part of aedeagus long, thinnest at the middle, its outer margin weakly grooved and outlined by rudimentary ridge (Fig. 1 right); copulatory piece short and broad (Fig. 1 left).

Female genitalia: Outer plate of vaginal apophysis triangular, 2/3 as broad as long; inner plate shaped as shallow cup, outer margin angulate, anterior rim broad (Fig. 2).

Variation: In specimens from mountain regions (Mt. Daisengendake), the upper surface of the body is always colored a bright copper, but in those from lower altitudes (including Okushiri Is.), it is a darker copper. The specimens from Okushiri Is. are averagingly larger.

Range: Southern part of Oshima Peninsula, Hokkaido (including Okushiri Is.).

Specimens examined: 23 (12 ♀♀, 11 ♂♂): 1 ♀, Akagawa, Hakodate-shi, vii 27 1968 (Y. Yasuda); 3 ♂♂, ditto, vii 29 1968 (Y. Yasuda); 1 ♀, ditto, viii 16 1968 (Y. Yasuda); 1 ♀, ditto, viii 18 1968 (Y. Yasuda); 1 ♀, 2 ♂♂, ditto, viii 22 1969 (Y. Ota & S. Sato); 1 ♀, Ohnuma-kôen, Hakodate-shi, vii 28 1966 (K. Suga); 4 ♀♀, 4 ♂♂, Mt. Daisengendake, vii 30 1966 (K. Suga); 1 ♂, ditto, vii 26 1969 (Y. Yasuda); 1 ♀, Okushiri Is., ix 16 1964 (M. Munakata); 2 ♀♀, 1 ♂, ditto, viii 6 1969 (S. Sato & K. Itsuji).



Figs 1-8. *Carabus albrechti albrechti* (1-3), *C. a. hidakanus* subsp. nov. (4-6), and *C. a. itoi* subsp. nov. (7, 8). [Copulatory piece and apical part of aedeagus (1), outer and inner plates of vaginal apophysis (2), and pronotum (3-8)]. 1, 2 & 3, Akagawa, Hakodate-shi; 4, Morappu, Tomakomai-shi; 5, Biratori, Biratori-chô; 6, Oiwake-tôge, Erimo-chô; 7, Rushin, Urahoro-chô; 8, Mt. Rausudake, Rausu-chô.

The specimens are preserved in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

***Carabus (Ohomopterus) albrechti hidakanus* subsp. nov.**

Apotomopterus albrechti (part.): Nakane, 1952, pp. 50-51, figs 32-Sapporo & 33-Tomakomai.

Apotomopterus albrechti (part.): Nakane, 1953, p. 96 (48), fig. 14: D-a, a'.

Apotomopterus japonicus albrechti (part.): Nakane, 1962, p. 39, fig. 37o-q, pl. IV: 61.

Apotomopterus albrechti albrechti (part.): Ishikawa, 1969, pp. 520-521.

Carabus (Ohomopterus) albrechti albrechti (part.): Ishikawa, 1985, p. 21, pl. 4: fig. 1a.

The populations of *Carabus albrechti* from Hokkaido have been regarded as representing *Carabus albrechti albrechti*, which was described based on specimens from Hakodate; however, the populations distributed from the environs of Sapporo to Hidaka Province on the Pacific coast of Hokkaido differ consistently from those of the type locality in the shape of the aedeagus, a more robust body, and the polychromatic upper surface of the body. They are discriminated here as a distinct subspecies.

Length: ♀, 23-26mm; ♂, 20.5-23mm.

Upper surface of body polychromatic, dark copper, greenish copper, dark green, or black with or without dull copper tinge. Legs wholly black, but part of tibiae rarely somewhat rufous. Antennae short, barely reaching beyond middle of elytra in male; underside of antennal segments 5-7 concave for about 1/3-1/2 their length, but concaved areas vaguely outlined and with sparse hairs. Head impunctate or at most weakly punctate from frons to neck. Inner margin of male protibia weakly convex but more so than in *C. a. albrechti*. Pronotum broader than in *C. a. albrechti*; disk less convex, with 3-5 marginal setae; postero-lateral corners more weakly and broadly produced than in *C. a. albrechti* (Figs 4-6). Elytra robust, shorter, broader and more convex than in *C. a. albrechti*; but striae as in the latter.

Male genitalia: Apical part of aedeagus uniformly thin, longer than in *C. a. albrechti*, its outer margin not grooved, barely outlined by rudimentary ridge (Figs 9, 11 & 13 right); copulatory piece longer than in *C. a. albrechti* (Figs 9, 11 & 13 left).

Female genitalia: Outer plate of vaginal apophysis longer and narrower than in *C. a. albrechti*, but anterior rim of inner plate narrower (Figs 10, 12 & 14).

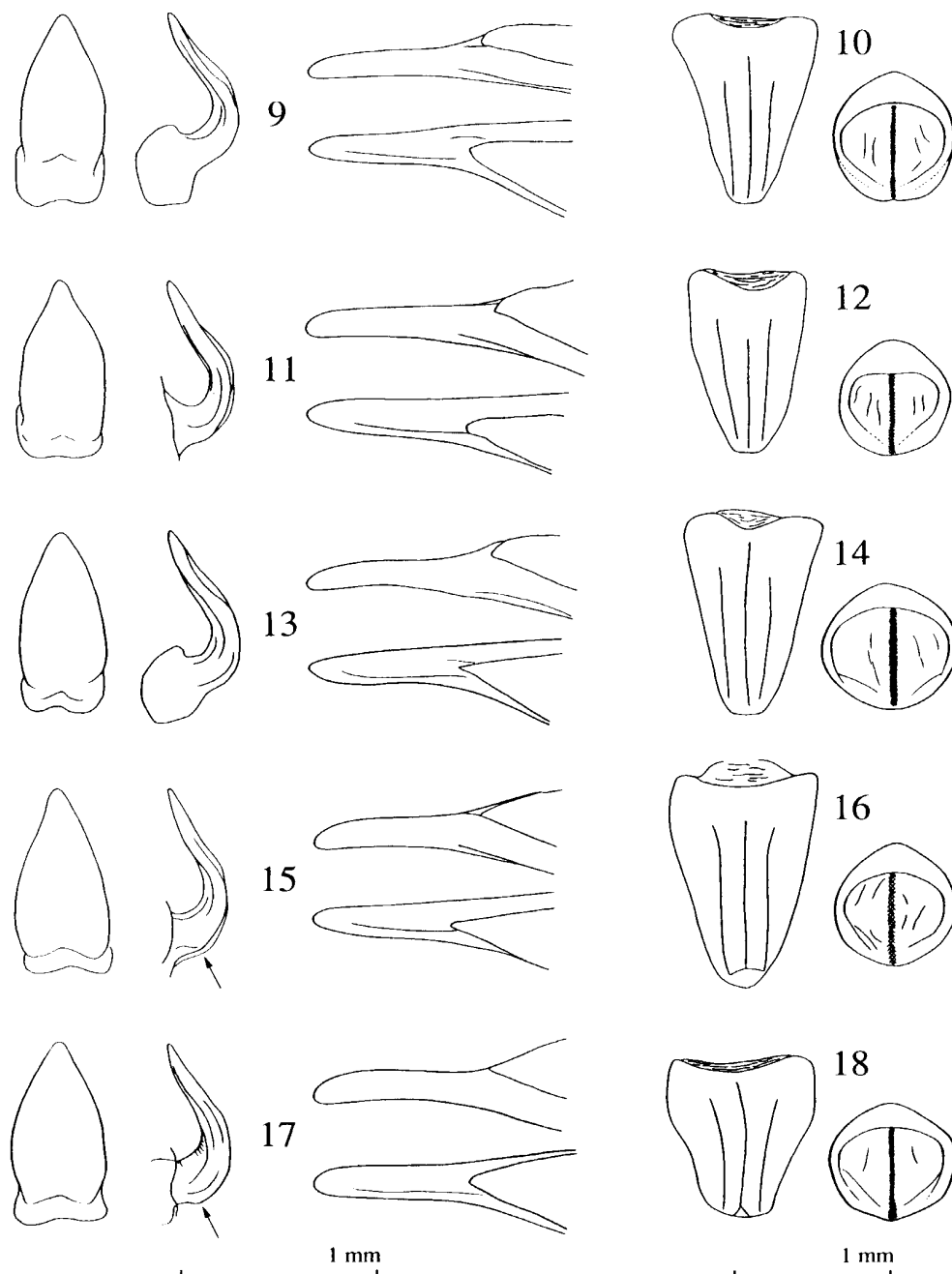
Range: Hokkaido, from the Pacific coast in the environs of Sapporo east to the southern part of Hidaka Province.

Holotype: ♂, Biratori, 60m, Biratori-chô, Hidaka, Hokkaido, viii 8-12 1976 (R. & F. Ishikawa) in the collection of R. Ishikawa at Tokyo Metropolitan University.

Paratypes from type locality: 40 ♀ ♀, 43 ♂ ♂, same data as holotype.

Other paratypes: Hokkaido: [Hidaka]: 4 ♀ ♀, 5 ♂ ♂, Oiwake-tôge, Erimo-chô, vii 24 1969 (R. Ishikawa); 1 ♂, Kamiutabetsu, Erimo-chô, vii 28 1961 (T. Okumura); 1 ♂, ditto, viii 13 1965 (Y. Syu); 8 ♀ ♀, 1 ♂, Horoman, Samani-chô, viii 21-25 1980 (R. & F. Ishikawa); 1 ♂, Mt. Apoidake, Samani-chô, vii 29 1964 (T. Okumura); 2 ♀ ♀, 1 ♂, Nishicha, Urakawa-chô, vii 25 1964 (T. Okumura); 1 ♂, Ikanndai, 150 m, Urakawa-chô, viii 17-19 1976 (R. & F. Ishikawa); 3 ♀ ♀, 10 ♂ ♂, Toyooka, Mitsuishi-chô, vi 21 1992 (K. Miyashita); 8 ♀ ♀, 25 ♂ ♂, Taiyô, 180m, Niikappu-chô, vii 10-13 1976 (R. & F. Ishikawa); 21 ♀ ♀, 9 ♂ ♂, Wakazono, 100m, Niikappu-chô,

viii 12-18 1978 (R. & F. Ishikawa); 19 ♀♀, 6 ♂♂, Biu, 200m, Niikappu-chô, viii 13-18 1978 (R. & F. Ishikawa); 5 ♀♀, 2 ♂♂, ditto, viii 1 1969 (R. Ishikawa); 1 ♀, Sanwa, Monbetsu-chô, viii 1 1969 (R. Ishikawa). [Iburi]: 15 ♀♀, 11 ♂♂, Niwa, 100 m,



Figs 9-18. *Carabus albrechti hidakanus* subsp. nov. (9-14) and *C. a. itoi* subsp. nov. (15-18). [Copulatory piece and apical part of aedeagus (9, 11, 13, 15 and 17), and outer and inner plates of vaginal apophysis (10, 12, 14, 16 and 18)]. 9 & 10, Morappu, Tomakomai-shi; 11 & 12, Biratori, Biratori-chô; 13 & 14, Oiwake-tôge, Erimo-chô; 15 & 16, Rushin, Urahoru-chô; 17 & 18, Mt. Rausudake, Rausu-chô.

Hobetsu-chô, viii 8-12 1976 (R. & F. Ishikawa); 4 ♀ ♀, 4 ♂ ♂, Morappu, Tomakomai-shi, vii 17 1959 (R. Ishikawa); 3 ♀ ♀, 10 ♂ ♂, ditto, vii 29 1959 (R. & F. Ishikawa); 43 ♀ ♀, 32 ♂ ♂, ditto, vii 6 1960 (R. & F. Ishikawa). [Ishikari]: 1 ♂, Shukubai, Chitose-shi, v 30 1989 (T. Sugawara); 1 ♀, Mt. Moiwayama, Sapporo-shi, vii 17 1959 (K. Morimoto); 1 ♀, 2 ♂ ♂, ditto, vi 14 1986 (K. Haga).

The specimens are preserved in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Etymology: Named for Hidaka Province, Hokkaido, where the type locality is located.

***Carabus (Ohomopterus) albrechti itoi* subsp. nov.**

Apotomopterus albrechti (part.): Nakane, 1953, p. 96 (48).

Apotomopterus japonicus albrechti (part.): Nakane, 1962, p. 39.

Apotomopterus albrechti albrechti (part.): Ishikawa, 1969, pp. 520-521.

Carabus (Ohomopterus) albrechti albrechti (part.): Ishikawa, 1985, p. 21.

The morphological boundaries of this new subspecies are tentative because its several small populations, distributed in the eastern part of Hokkaido, are slightly different from one another. This subspecies is nearer to *C. albrechti hidakanus* than to *C. a. albrechti*, but is distinguished from both by the following characters.

Length: ♀, 23-25mm; ♂, 22-23.5mm.

Upper surface dark copper. Legs black, but part of tibiae may be somewhat rufous. Antennae shorter than in *C. a. albrechti*, slightly exceeding basal 1/3 of elytra even in male; hairless areas in male antennae vague, more indistinct than in *C. a. hidakanus*. Inner margin of male protibia weakly convex as in *C. a. albrechti*. Head almost impunctate on front. Pronotum broader than in *C. a. albrechti*, with 2-4 (rarely 5 in male) marginal setae; sides well convex anteriorly, postero-lateral corners less produced than in *C. a. hidakanus* (Figs 7 & 8). Elytra broad and well convex, similar to those in *C. a. hidakanus*, but shorter than in *C. a. albrechti*; striae as in the latter.

Male genitalia: Apical part of aedeagus as long as in *C. a. albrechti* and thicker than in *C. a. hidakanus*, its outer margin not grooved, barely outlined by rudimentary ridge (Figs 15 & 17 right); lateral margins of copulatory piece raised near base (Figs 15 & 17 left, arrow).

Female genitalia: Vaginal apophysis with outer plate broader; inner plate as in *C. a. hidakanus* (Figs 16 & 18).

Variation: Specimens from the Shiretoko Peninsula differ from those of the type locality as follows: head with coarser rugae from frons to neck and pronotum with transverse rugae flanking median line; apical part of aedeagus more cylindrical, slightly bent beyond middle (Fig. 17 right); lateral margins of copulatory piece more distinctly raised near base (Fig. 17 left, arrow); outer plate of vaginal apophysis shorter (Fig. 18 left).

Range: Hokkaido, the Shiranuka Hills and the Shiretoko Peninsula.

Holotype: ♂, Rushin, Urahoro-chô, Tokachi, Hokkaido, i 4 1994 (K. Itô) in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Paratypes from type locality: 6 ♀ ♀, 5 ♂ ♂, same data as holotype.

Other paratypes: 1 ♀, Mt. Rausudake, Rausu-chô, Nemuro, viii 2 1964 (T. Okumura); 1 ♂, ditto, viii 23 1963 (T. Okumura); 1 ♂, ditto, viii 3 1964 (T. Okumura).

The specimens are preserved in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Etymology: Named after Mr. Katsuhiko Ito, who collected the type series at the type locality.

***Carabus (Ohomopterus) albrechti echigo* subsp. nov.**

Apotomopterus albrechti (part.): Nakane, 1953, p. 96 (48), fig. 14: D-4.

Apotomopterus japonicus freyi (part.): Nakane, 1962, pp. 37-39, fig. 37w.

Apotomopterus japonicus freyi (part.): Nakane, 1963, pp. 11-12.

Apotomopterus albrechti freyi (part.): Ishikawa, 1969, pp. 520-521.

Carabus (Ohomopterus) albrechti esakianus (part.): Ishikawa, 1985, p. 21.

This new subspecies is distributed over the greater part of Niigata Prefecture from approximately south of the Aganogawa River and including the coastal region of the Sea of Japan. It was included in *Apotomopterus japonicus freyi* (now a subspecies of *Carabus albrechti*) by Nakane (1962, 1963) because of its wholly black legs, and was distinguished from *Apotomopterus japonicus esakianus* (now a subspecies of *Carabus albrechti*) by the same character, but it can be discriminated from either by the distinctly grooved apical part of the aedeagus.

Length: ♀, 20-23mm; ♂, 19.5-21.5mm.

Legs and palpi wholly black. Antennae of male reaching middle of elytra; underside of antennal segments 5-7 with shallow hairless depressions about 1/2-2/3 as long as each segment. Inner margin of male protibia more weakly angulated than in *C. a. esakianus* and *C. a. okumurai*. Pronotum with 3-4 (rarely 5) marginal setae; side margins distinctly emarginated posteriorly behind middle, with postero-lateral corners distinctly produced backwards (Figs 27-29). Elytra narrow, broadest behind middle; more weakly convex than in *C. a. esakianus* and *C. a. okumurai*; shoulders weakly convex, lateral margins nearly straight anteriorly, especially in male, but less parallel than in *C. a. freyi*; striae very weakly notched.

Male genitalia: Apical part of aedeagus abruptly tapered from its base, with groove on outer margin more distinct than in *C. a. esakianus* (Figs 19, 21 & 23 right); copulatory piece with pointed apex (Figs 19 & 21 left), narrower in specimens from transitional zone to *C. a. okumurai* (Fig. 23 left).

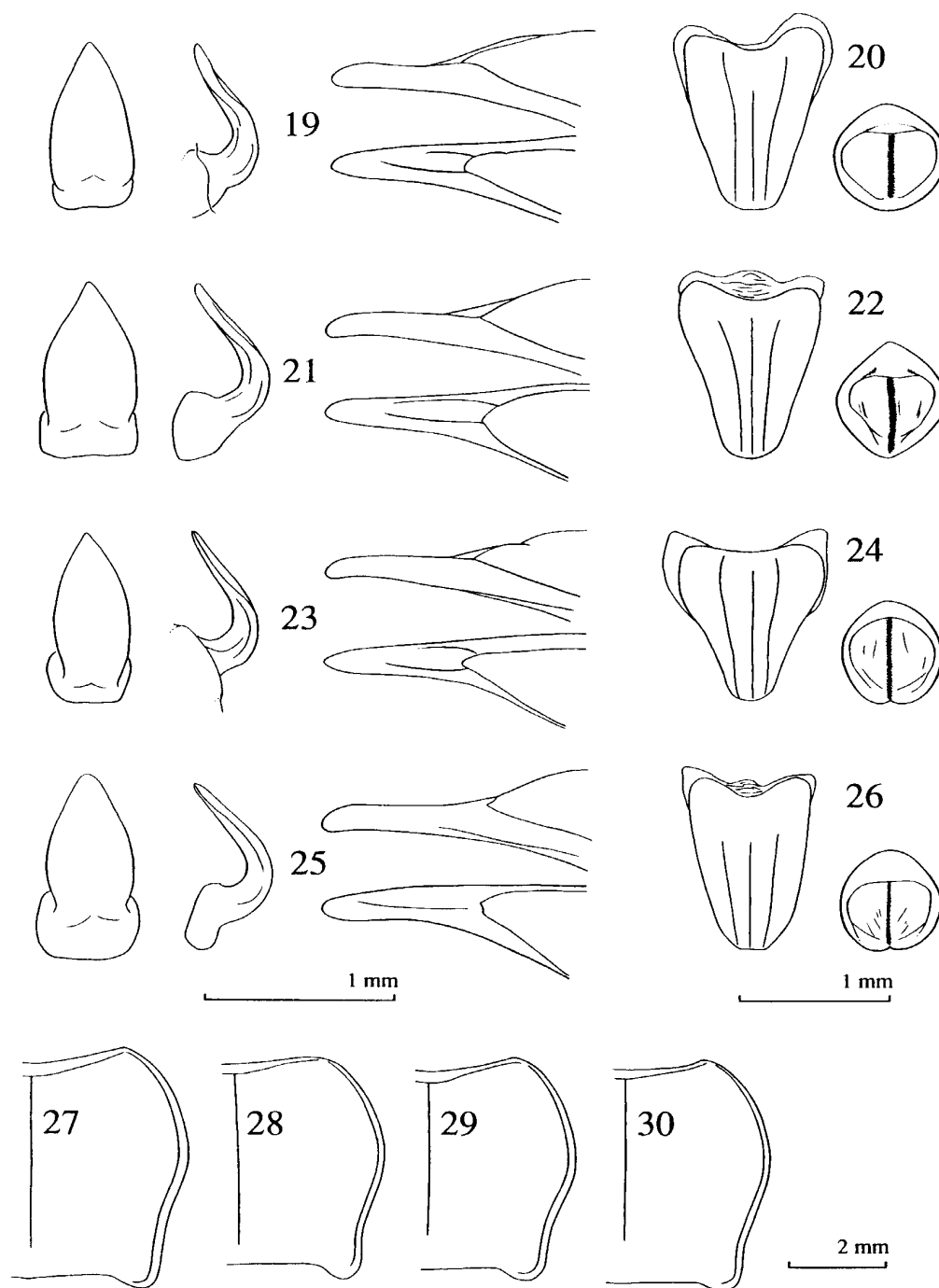
Female genitalia: Outer plate of vaginal apophysis narrower than in *C. a. okumurai* and *C. a. esakianus*; inner plate with broader outer rim (Figs 20 & 22), or broader outer plate and inner plate with narrower rim in specimens from transitional zone to *C. a. okumurai* (Fig. 24).

Range: The greater part of Niigata Prefecture and adjacent regions as far south as Hakuba-mura in Nagano Prefecture, where it intergrades with *C. a. okumurai*.

Holotype: ♂, Mugurazawa, 190m, Yunotani-mura, Niigata Prefecture, v 31-vi 1993 (R. & F. Ishikawa) in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Paratypes from type locality: 8 ♀ ♀, 1 ♂, same data as holotype.

Other paratypes: Fukushima Prefecture: 6 ♀ ♀, 2 ♂ ♂, Kamiigusa, 400 m, Kaneyama-machi, ix 3-5 1983 (R. & F. Ishikawa); 1 ♀, Mt. Asakusa-dake, 750 m, Tadami-machi, vii 18 1979 (K. Nemoto); 1 ♂, ditto, 19 vii 1979 (K. Nemoto); 2 ♀ ♀, 2 ♂ ♂, ditto, 20 vii 1979 (K. Nemoto). Niigata Prefecture: 1 ♀, Mt. Tsukiokayama,



Figs 19-30. *Carabus albrechti echigo* subsp. nov. (19-24, 27-29) and *C. a. awashimae* subsp. nov. (25, 26, 30). [Copulatory piece and apical part of aedeagus (19, 21, 23 and 25), outer and inner plates of vaginal apophysis (20, 22, 24 and 26), and pronotum (27-30)]. 19, 20, & 27, Mugurazawa, Yunotani-mura; 21, 22, & 28, Iwadaira, Komi, Nou-shi; 23, 24, & 29, Kayou, Hakuba-mura (transitional zone to *C. a. okumurai*); 25, 26, & 30, Awa-shima Is.

Sanjō-shi, v 22 1967 (H. Koike); 3 ♀ ♀, 1 ♂, Watabe, 10 m, Teradomari-shi, vi 8-9 1993 (R. & F. Ishikawa); 1 ♀, 1 ♂, Mottate-tôge, 400-420 m, Nagagoka-shi, x 7-9 1992 (R. & F. Ishikawa); 25 ♀ ♀, 6 ♂ ♂, WNW foot of Mt. Yoneyama, 250 m, Kashiwazaki-shi, viii 17-18 1991 (T. Suda); 4 ♀ ♀, 1 ♂, Kamikata, 10 m, Kashiwazaki-shi, vi 9-10 1993 (R. & F. Ishikawa); 2 ♀ ♀, 2 ♂ ♂, Tanaka, 260 m, Ueda, Tsunan-machi, vi 1-2 1993 (R. & F. Ishikawa); 1 ♀, 1 ♂, Mukaiyama, 1000 m, Yuzawa-machi, vi 3 1995 (K. Haga); 7 ♀ ♀, 4 ♂ ♂, Nishitono, 40 m, Jôetsu-shi, vi 13-14 1990 (R. & F. Ishikawa); 10 ♀ ♀, 4 ♂ ♂, Iwadaira, 60-90 m, Komi, Nou-shi, vi 13-14 1990 (R. & F. Ishikawa); 1 ♀, 1 ♂, Rindô, 10-50 m, Suzawa, Ohmi-machi, vi 13-15 1989 (R. & F. Ishikawa); 9 ♀ ♀, 5 ♂ ♂, env. Hatsudensho, 10 m, Suzawa, Ohmi-machi, vi 14-15 1989 (R. & F. Ishikawa); 6 ♀ ♀, Hakamaiwa, 90 m, Itoigawa-shi, v 28-29 1991 (R. & F. Ishikawa); 23 ♀ ♀, 6 ♂ ♂, Nakajôho, Itoigawa-shi, 350 m, v 28-29 1991 (R. & F. Ishikawa); 7 ♀ ♀, 1 ♂, Kuzuba-tôge, 450 m, Itoigawa-shi, vi 12-13 1990 (R. & F. Ishikawa). Myôkô Mts.: 3 ♀ ♀, 1 ♂, Tsubame, 1000-1080 m, vi 12-15 1986 (R. & F. Ishikawa); 2 ♀ ♀, 2 ♂ ♂, near Sekimi-tôge, 970 m, vi 13-14 1986 (R. & F. Ishikawa); 9 ♀ ♀, 12 ♂ ♂, Akakura route to Seki, 845 m, vi 24-25 1988 (R. & F. Ishikawa); 1 ♀, Akakura, 820 m, vi 13-14 1986 (R. & F. Ishikawa). Nagano Prefecture: 2 ♀ ♀, 3 ♂ ♂, Sasazawa NE of Nozawaonsen, 480 m, Iiyama-shi, ix 6-7 1990 (R. Ishikawa); 2 ♀ ♀, Hakusanjinja, Kuwanagawa, Iiyama-shi, ix 7 1993 (M. Ujiie); 11 ♀ ♀, 12 ♂ ♂, Mt. Habiroyama, Iiyama-shi, 22-24 viii 1995 (M. Ujiie); 5 ♀ ♀, 3 ♀ ♀, Mushiu, Nozawaonsen-mura, viii 22-24 1995 (M. Ujiie); 1 ♀, 2 ♂ ♂, Koakazawa, 770 m, Sakae-mura, vi 2-3 1993 (R. & F. Ishikawa); 5 ♀ ♀, 3 ♂ ♂, Wayama, 1000 m, Sakae-mura, vi 2-3 1993 (R. & F. Ishikawa); 1 ♂, Taneike, 1140-1180 m, Togakushi-mura, vi 23-24 1988 (R. & F. Ishikawa); 2 ♀ ♀, 1 ♂, Koshimizugahara, 1254 m, Togakushi-mura, vi 23-24 1988 (R. & F. Ishikawa); 21 ♀ ♀, 11 ♂ ♂, Otariosen-Kamaike, 970-1070 m, Otari-mura, vi 14-15 1990 (R. & F. Ishikawa); 10 ♀ ♀, 2 ♂ ♂, Kuruma, 450 m, Otari-mura, vi 14-15 1990 (R. & F. Ishikawa); 2 ♀ ♀, 1 ♂, ditto, 400-430 m, vi 7-8 1995 (Y. Takami); 12 ♀ ♀, 6 ♂ ♂, Sotozawa, 500-550 m, Otari-mura, vi 19-20 1990 (R. & F. Ishikawa); 3 ♀ ♀, Ishihara, 550 m, Otari-mura, v 27-29 1991 (R. & F. Ishikawa); 2 ♀ ♀, 1 ♂, Dorosaki, 660 m, Chikuni, Otari-mura, vi 12-13 1990 (R. & F. Ishikawa); 8 ♀ ♀, 10 ♂ ♂, Tsuchikura, 680 m, Otari-mura, v 27-30 1991 (R. & F. Ishikawa); 8 ♀ ♀, 5 ♂ ♂, ditto, 760 m, v 27-30 1991 (R. & F. Ishikawa).

Other specimens examined: [Transitional population to *C. a. okumurai*]: 17 ♀ ♀, 8 ♂ ♂, Kayou by Rt.148, 650 m, Hakuba-mura, vi 12-13 1990 (R. & F. Ishikawa). [Putative hybrid populations between *C. a. echigo* and *C. a. tohokuensis*]: Fukushima Prefecture: 10 ♀ ♀, 7 ♂ ♂, Ôhara, 660 m, Ina-mura (west of the Inagawa River), ix 11-12 1995 (Y. Takami); 7 ♀ ♀, 5 ♂ ♂, Miyazawa, 610-620 m, Ina-mura (west bank of the Inagawa River), ix 11-12 1995 (Y. Takami); 1 ♀, 1 ♂, Uchikawa, 590 m, Ina-mura (west bank of the Inagawa River), ix 12-13 1995 (Y. Takami).

The specimens are preserved in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Etymology: Named for old name of Niigata Prefecture, where the type locality is located.

***Carabus (Ohomopterus) albrechti awashimae* subsp. nov.**

Apotomopterus japonicus freyi (part.): Nakane, 1962, pp. 37-39.

Apotomopterus albrechti (part.): Ishikawa, 1969, pp. 520-521.

This new subspecies is described on the specimens from Awashima Is. It is comparable with *C. a. freyi* of Sado Is, but not polychromatic as in that subspecies, and differs in other morphological characters as described below:

Length: ♀, 22.5-24.5mm; ♂, 20.5-22.5mm.

Upper surface of body dark brownish or reddish copper; greenish or black individuals not known. Legs and palpi wholly black. Head with fine longitudinal wrinkles by inner margins of eyes. Antennae shorter than in *C. a. freyi*, not reaching middle of elytra even in male; underside of antennal segment 5-7 with poorly outlined hairless areas about 1/3-1/2 as long as each segment. Inner margin of male protibia weakly convex as in *C. a. freyi*. Pronotum with antero-lateral corners more produced, but postero-lateral corners less produced, than in *C. a. freyi* (Fig. 30); with 3-4 marginal setae; punctuation of disk sparser medially. Elytra less convex above, and with shoulders more produced than in *C. a. freyi*; striae strongly notched.

Male genitalia: Aedeagus similar to that of *C. a. freyi* but apical part thicker (Fig. 25 right); copulatory piece with apex rounded, constricted at base (Fig. 25 left).

Female genitalia: Outer plate of vaginal apophysis similar to but narrower than in *C. a. freyi*; inner plate with anterior rim broader (Fig. 26).

Range: Awashima Is., Niigata Prefecture.

Holotype: ♂, Awashima Is., Niigata Prefecture, x 25-28 1963 (R. Ishikawa) in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Paratypes: 13 ♀ ♀, 16 ♂ ♂, same data as holotype; 4 ♀ ♀, 4 ♂ ♂, Kamaya, Awashima Is, Niigata Prefecture, vii 21-23 1991 (T. Suda).

The specimens are preserved in the collection of R. Ishikawa, deposited at Tokyo Metropolitan University.

Etymology: Named for Awashima Is, the type locality of this subspecies.

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References

- Bates, H. W. 1873. On the geodephagous Coleoptera of Japan. Transactions of the Entomological Society of London 1873: 219-234.
- Breuning, S. 1932. Monographie der Gattung *Carabus* L. Bestimmungs-Tabellen der europäischen Coleopteren (104-110): 1-1610, 4 pls. Troppau.
- Breuning, S. 1934. Ueber Carabini. Folia Zoolgica et Hydrobiologica 6: 29-40.
- Emden, F. van, 1932. Einige neue Carabinae des Staatlichen Museums für Tierkunde zu Dresden.

- Neue Beiträge zur systematische Insektenkunde 5 (4/5): 62-69, 1 pl.
- Géhin, J. B. 1885. *Catalogue Synonymique et Systématique des Coléoptères de la Tribu Carabides*. xxxviii + 103 pp., 10 pls., Remiremont, Prague.
- Ishikawa, R. 1966. Descriptions of new subspecies in the Japanese Carabina. Bulletin of the National Science Museum, Tokyo 9 (4): 451-453.
- Ishikawa, R. 1969. A taxonomic study on *Apotomopterus japonicus* (Motschulsky) and its allied species (Coleoptera, Carabidae). Bulletin of the National Science Museum, Tokyo 12: 517-530.
- Ishikawa, R. 1984. Two new subspecies of Japanese Carabina (Coleoptera, Carabidae). Akitu, n. ser. 68: 1-6.
- Ishikawa, R. 1985. The Family Carabinae. In: S. Uéno, Y. Kurosawa & M. Sato (Eds), *The Coleoptera of Japan in Color*, Vol. 2. pp. 14-54. Hoikusha, Osaka. (In Japanese)
- Kamiyoshi, M. 1963. On the female genitalia of *Apotomopterus* from Japan (Col., Carabidae). Insect Science, 13: 1-8. (In Japanese)
- Lewis, G. 1882. A supplementary note on the specific modifications of Japan Carabi, and some observations on the mechanical action of solar rays in relation to colour during the evolution of species. Transactions of the entomological Society of London 1882: 503-530.
- Morawitz, A. 1862. Vorläufige Diagnosen neuer Carabiden aus Hakodate. Bulletin de l'Académie impériale des Sciences de St.-Pétersbourg 4: 237-247.
- Morawitz, A. 1863. Beitrag zur Käferfauna der Insel Jesso. Mémoires de l'Académie Imperiale des Sciences de St.-Pétersbourg, ser. 7, 6 (3). pp. i-iii + 1-84.
- Nakane, T. 1952a. Distribution and variation of the Japanese *Carabus*, with special reference to *C. insulicola* and its allied species. Shin-Konchû 5 (6): 12-13. (In Japanese)
- Nakane, T. 1952b. The beetles of Japan (4). Shin-Konchû 5 (11): 46-51. (In Japanese)
- Nakane, T. 1953. New or little known Coleoptera from Japan and its adjacent regions IX. Caraboidea II. Science Report of Saikyo University (Natural Science & Living Science) 1: 93-102.
- Nakane, T. 1962. *Insecta Japonica* 2 (3). *Carabidae* 1, 2 + 98 pp., 6 pls, Hokuryukan, Tokyo. (In Japanese, with English summary)
- Nakane, T. 1963. The Family Carabidae. In: T. Nakane, K. Ohbayashi, S. Nomura & Y. Kurosawa (Eds) *Iconographia Insectorum Japonicorum, Colore naturali edita*, Vol. 2 (Coleoptera) pp. 3-54, Pls. 3-27. Hokuryukan, Tokyo. (In Japanese)